

Adoption of Improved Technologies of Kharif Crops in Arid Zone

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Abstract: A study was conducted in four districts namely, Jodhpur, Pali, Bikaner and Jaisalmer of Rajasthan to study the adoption of improved technologies of kharif crops and to find out the relationship between socio-economic characteristics of the farmers and adoption of technology. The study revealed that extent of adoption of improved technologies of kharif crops was between 29 to 32%. The study also revealed that majority of the farmers had adopted high yielding varieties, seed treatment, application of nitrogenous and phosphatic fertilizers and plant protection measures to a lesser extent.

Key words: Adoption, improved technology, kharif crops.

The arid region of India spread over 38.7 Mha area, out of which 19.6 Mha is located in Rajasthan. The arid region is constrained by environmental limitations such as low precipitation (100 to 450 mm year⁻¹), high temperature (above 45°C during May-June), high wind speed (30 to 40 km h⁻¹), high potential evapotranspiration (1500 to 2000 mm year⁻¹), poor soil physical and fertility conditions, low water retention capacity of soils and low and erratic rainfall (100 to 420 mm). The main crops grown in kharif season in the region are pearl millet, mung bean, moth bean, clusterbean and sesame. The productivity of these crops is very low (250-800 kg ha⁻¹) as compared to potential yield (600 to 2000 kg ha⁻¹). Despite many biotic and abiotic factors, low adoption of the improved technologies is the main problem in arid zone. Hence keeping this in view the study was undertaken to study the socio-economic characteristics of the farmers, the extent of adoption of improved technologies of kharif crops and the relationship between socio-economic characteristics and adoption of improved technologies of kharif crops.

Materials and Methods

The study was conducted in 4 districts of Rajasthan namely Jodhpur, Pali, Bikaner and Jaisalmer. Two panchayat samities from each district and from each panchayat samiti one village was selected. From each village 24 farmers were selected randomly during 2003. Thus the sample size was 192.

For study the adoption of important practices namely high yielding varieties, recommended seed rate, seed treatment, time of sowing, method of sowing, application of nitrogenous and phosphatic fertilizers and plant protection measures of kharif crops i.e., pearl millet, mung bean, moth bean, clusterbean and sesame were considered. The data were collected using pre-tested structured schedule by personal interview method.

The extent of adoption was calculated by adoption index developed by Karthikeyan (1994). The adoption index (AI) of the farmers for the selected seven recommended practices was worked out by using the formula:

$$AI = \frac{\text{Respondent's total score}}{\text{Total possible score}} \times 100$$

Respondent's total score = Total number of practices adopted by the farmers multiplied by respective practice weightage and summated.

The responses received from the respondents were categorized as low (up to 33.33%), medium (33.34 to 66.66%) and high adoption (above 66.66%).

Results and Discussion

Socio-economic characteristics of the respondents

Majority (63.02%) of farmers were in the age group of 31 to 50 years, belong to backward caste (60.94%), illiterate (65.10%) residing in the single family (55.21%) system with 6-10 members, had 11 to 20 years farming

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experience (58.85%). In case of annual income, 38.02% of the farmers had annual income between Rs. 25,001 to Rs. 50,000 and 27.60% farmers had annual income above Rs. 50,000. It was observed that majority of the farmers were having low extension (58.33%), source of information (60.42%), medium economic motivation (68.75%), high scientific orientation (76.56%) and high-risk orientation (56.25%).

Practice wise adoption of improved technologies of kharif crops

Majority (53.12%) of the farmers adopted high yielding varieties of pearl millet followed by mung bean (31.25%), clusterbean (22.22%) and moth bean (21.66%). The adoption of high yielding varieties of sesame was reported by 15.63% farmers. Only 3 to 9% farmers had adopted seed treatment in various kharif crops. The low and no adoption of seed treatment might be due to lack of knowledge, and lack of interest. Regarding recommended seed rate, sowing time and method of sowing, majority of the farmers (51 to 84%) adopted these practices in kharif crops.

It was found that only 13.75% farmers were applying nitrogenous fertilizers to pearl millet. Very few farmers (1-2%) were applying nitrogenous fertilizers to mung bean, moth bean, clusterbean and sesame crops. Only 3-4% farmers were applying phosphatic fertilizers to pearl millet and mung bean crops. Only 1-2% farmers were applying phosphatic fertilizers to clusterbean crop. No farmer was applying phosphatic fertilizers to moth bean and sesame crops. Regarding plant protection measures, none of the farmers was applying any insecticide/pesticide to pearl millet crop. Only 3-6% farmers were applying plant protection to mung bean, moth bean and clusterbean crops. The probable reason for low adoption of plant protection measures may be lack of knowledge about insecticides, lack of technical guidance and their high cost.

Overall adoption of improved technology of kharif crops

Overall adoption of improved technology for pearl millet, mung bean, moth bean, clusterbean and sesame crop was 32.25, 30.35, 29.62, 31.68 and 29.76%, respectively. It was found that 47.50% pearl millet growing farmers belonged to low adoption category,

followed by medium adoption (46.25%) and high adoption category (6.25%). With regard to mung bean, moth bean and sesame crop, majority of the farmers belonged to medium adoption category. In case of clusterbean crop, majority of the farmers belonged to low adoption category (54.17%) followed by 39.58% medium and 6.25% high adoption category. Similar findings were reported by Singh (2004), Singh and Chauhan (2008, 2010).

Relationship between socio-economic characteristics of the farmers and adoption of improved technologies of kharif crops

To find out the relationship between socio-economic characteristics of the farmers and adoption, correlation coefficient was worked out. A positive and highly significant correlation was found between education, irrigation facilities, annual income, extension contact, sources of information, economic motivation, scientific orientation, risk orientation and knowledge and adoption of pearl millet technology. It shows that farmers who had more education, more irrigation facilities, more annual income, more extension contact, more sources of information, high economic motivation, high scientific orientation, more risk orientation and more knowledge had more adoption.

Sumathi and Alagesan (1998) reported that contact with extension agencies of the farmers was positively and significantly correlated with adoption of the technology. Singh (2002) reported that education and contact with extension agencies had positive and significant relationship with adoption. Chaudhary *et al.* (2001) found positive and significant relationship between education, annual income and sources of information utilization pattern with adoption.

In case of mung bean technology, out of 16 variables, occupation and knowledge were found to have a positive and significant correlation with adoption, which indicated that farmers who had agriculture occupation and had more knowledge had more adoption rate. Data further indicated that the variables education, occupation, extension contact, sources of information, economic motivation, scientific orientation and knowledge were found to be positive and significantly correlated with adoption of moth bean technology.

In respect of clusterbean technology, variables like education, irrigation facilities, annual income, and extension contact, sources of information, economic motivation, scientific orientation, risk orientation and knowledge were found to be positive and significantly correlated with adoption. In case of sesame technology, age, land holding size, irrigation facilities, farming experience, annual income, sources of information and knowledge were found to be positive and significantly correlated with adoption. It shows that farmers who had older age, more land-holding size, irrigation facilities, more farming experience, more annual income, more sources of information and more knowledge had more adoption rate.

Conclusions

It can be concluded that majority of the farmers had adopted recommended seed rate, time of sowing and method of sowing, to a great extent while improved varieties, seed treatment, application of nitrogenous and phosphatic fertilizers and plant protection measures were adopted to a lesser extent. The variable knowledge had positive significant correlation with adoption of improved technologies of kharif crops. The study suggests conducting demonstrations at village level, campaigns, field

visit, intensive training programs and group discussions for increasing the extent of adoption of improved technologies in the region.

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